

BAUER (Louis).

To

D. Marsh, Prof of Surgery,
with the author's most
respectful Compliment.

DR. BAUER

ON

HIP-JOINT DISEASE.

the first time in the history of the world, the
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will be able to read the same book, and
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a large number of copies, and will

SOME OBSERVATIONS
ON
HIP-JOINT DISEASE,
AND *Presented by*
ITS RATIONAL TREATMENT, *8th March*
BY ✓
LOUIS BAUER, M. D.,

PHYSICIAN AND SURGEON (BERLIN), MEMBER OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND, CORRESPONDING FELLOW OF THE MEDICAL SOCIETY OF LONDON, LATE SURGEON OF THE ROYAL ORTHOPÆDIC INSTITUTION AT MANCHESTER, ETC., ETC.

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THE charm of celebrated names and the so-called scientific authorities, have caused considerable difficulties to the material progress of knowledge by propagating, but too often, fictions and hypotheses in the form of deliberate observation and diligent inquiries, thus setting matters of great moment at rest, and deterring others from appropriate investigations. And in no other branch of science, has the mischief of unfounded theory been more deeply felt, than in those relying entirely on the solid foundation which facts alone afford, minute study of nature herself, as in natural philosophy and medicine.

In science, no other authority should be recognized, than that of indisputable verity; phantasms are better limited to the department of romance, to which they belong. We may, however, congratulate ourselves, that the time of implicit belief in scientific celebrities is fast passing away, and medical inquirers are no longer prevented, by the mere theorems of distinguished men, from following their own course of investiga-

ting those numerous pathologic problems which we meet with every day. But still a very augean labor, and the combined exertions of men alike devoted to truth, science, and suffering humanity, will yet be required, to bring many medical doctrines in strict conformity with the actual operations of nature.

Hip-joint disease, and the rules of its treatment, are subjects apparently laboring under similar disadvantages to those just complained of, namely, that of having been obscured for a considerable time under the influence of hypotheses which were totally void of real proofs. I am sorry to state that German surgeons of distinction, especially Rust, and others, have largely contributed to deceive the profession as to the nature of hip-joint disease and its rational treatment. It is remarkable, that although daily experience shows the direct contrary, and that notwithstanding some authors have lately, supported by undeniable facts and experiments, pointed out also the fallacy of the established opinion of the nature of hip-joint disease and its collateral symptoms, we still find numerous practitioners, who adhere to the notions of the old school, and pursue a plan of treatment which never has and never could effect any beneficial result, but on the contrary, has invariably sacrificed the form of their patients, if not life itself.

Under such circumstances, I feel justified in bringing the subject in question before the profession; and while thus giving rise to its renewed consideration, I at the same time submit my views on hip-joint disease to a critical appreciation. I sincerely hope some truth will be the result of this literary effort, and this is the only object desired by the author.

It cannot be expected, nor is it necessary, that I should discuss at length the details of hip-joint disease; and I shall therefore confine myself strictly to the consideration of those points, which are either novel or matters of dispute, and endeavor to give a final solution and critical analysis, highly desirable both to science and the afflicted. Although I may happen to bring forward in this article some new facts and deductions, I beg to decline originality or novelty, as far as I am myself concerned. My whole merit, if such it be, redu-

ces itself to a careful compilation of the opinions of Drs. Buehring, Lorinser, Bonnet, Bishop, and others, and the corroboration of their views by my own researches and experience, which embrace, however, a considerable time and material. I deeply regret that I could not procure in proper time the paper on this very subject, by Prof. March of Albany, which was read to the American Medical Association. I should have availed myself of it with that consideration which is due to its distinguished author.

Some writers define hip-joint disease to be an inflammation and subsequent ulceration of either the synovial lining of that joint, or the articular cartilages, or the caput femoris, admitting the unavoidable transmission of the morbid process from one to another. According to my own experience, in all genuine cases of hip-joint disease, the primitively affected part is the osseus portion of the femoral head, while the cartilages and synovial membrane only become secondarily involved, and subsequently destroyed by the disease. The definition of hip-joint disease ought therefore to be limited to those cases, and not likewise extended to the primary affection of the synovial sac, which may lead to hydrarthrus, pyodrarthrus and degeneration, but scarcely ever to that disease of protean nature, known under the name coxalgia, *morbus coxae*, or coxarthrocace. The cartilages are, in general, so inert, torpid, and of such slight susceptibility to affections of any description, that it is incomprehensible why the articular cartilages of the femoral joint should be more subject to the inflammatory and suppurative process, than others of the same organization and vitality.

Another difference of opinion exists as to the causes presumptive. I think, however, that the majority of medical men who have paid some attention to the subject in question, have agreed in attributing to the tuberculous deposits made in the spongy structure of the femoral head, the exclusive and proximate cause of hip-joint disease; at the same time admitting that external injuries, cold, gastric malady, fever, &c., may serve as the first shock, and greatly accelerate the softening and subsequent elimination of the deposited matter; in point of fact, may co-operate with the noxiousness of the tuber-

cular deposits already formed ; but by no means are they, of themselves, sufficient to cause the affection in question. Indeed, if such trifling causes as those above mentioned, and which, moreover, are of daily occurrence, were, by themselves, sufficient to produce hip-joint disease, this malady would certainly be much more frequent than it actually is. Moreover, wherever we meet with a case of hip-joint disease, we invariably find a certain age, especially subject to the ravages of the scrofulous dyscrasy, and patients afflicted with hip-joint disease are usually highly distinguished by unmistakable symptoms of that malady. Again, we find, both in the discharge and in the cellular texture of the caput femoris, when examined post mortem, the amorphous particles of tubercular deposit. Another argument is, finally, the simultaneous occurrence of hip-joint disease with tubercles in other organs of the body.

It is of great importance in the treatment of hip-joint disease, that its essential origin should be properly understood and appreciated ; and be it therefore repeated—

1. Hip-joint disease is primarily seated in the caput femoris.
2. Hip-joint disease originates exclusively from tubercular depositions into the cells of that bone.

3. The object which nature purposes to realize by those depositions, is the elimination of the noxious tubercular substance from within the organism.

4. The softening of the tubercles begins, either in consequence of some accidental traumatic or other injury, or spontaneously, by the gradual juxtaposition and augmentation of the tuberculous matter, which becomes at last obnoxious to the bone, and sets up reaction and inflammation.

5. As soon as this process takes place, the tuberculous mass softens, and approaches the surface of the bone, involving more or less the periosteum, cartilage, and synovial lining of the joint in destruction.

6. If the matter reaches the external surface in the shortest way, by penetrating the neck of the femur—a rare case—the destruction may be trifling, and the cure soon consummated, as far as the joint itself is concerned. But, if the matter enters the articular cavity, a more extensive destruction must necessarily be the result. In this latter case we perceive a

thickening and softening of the articular cartilage, which separates into fragments, and, sloughing with its bone, floats about within the articular cavity, adding the new disadvantage of a foreign body to the disease. The synovial sac ulcerates consequently, and the whole joint is more or less transformed into an osseous ulcer. Small fistulae lead in different directions to the external surface, and the environs of the joint are rather infiltrated, and indurated.

7. In this state the disease continues as long as there are still tuberculous deposits and cartilaginous fragments to be removed, provided that death does not earlier close the scene.

8. Nature effects the restoration in various ways, either by establishing a true ankylosis, with deposits of bony matter within and around the acetabulum, with the loss of all mobility of the joint, unquestionably a very rare case, or the two opposite articular surfaces unite by fibrous substance (spurious ankylosis), which is the usual termination of hip-joint disease. In extremely rare cases, the whole joint is filled up with fibrous formations, interfering greatly with the mobility of the hip-joint; but, in most of the cases, fibrous adhesions exist only partially, while another part of the articular surface is denuded even of its cartilaginous covering and smooth-like, being polished. As a modification of the termination of hip-joint disease, we meet also with luxations of the head of the femur. It is easily understood that cases of the last description must necessarily be of very limited number, and that a most extensive carious destruction is to be premised, both of the femoral head, and the supercilium and labrum acetabuli. The luxation of the femur is, by no means, of such frequent occurrence as Rust and other German authors have stated; but of this hereafter.*

I wish now to direct attention to some symptoms, which, although of a more secondary character, are, nevertheless, of great importance both to science and practice, and which, up to this time, have not been duly appreciated.

* The writer has the pleasure to state, that, by the kind and generous permission of Dr. Parker, Professor of Surgery at the College of Physicians and Surgeons, he has had the opportunity of illustrating the principles and practice set forth above, in a clinical lecture before the students of that College, for which he tenders that gentleman his most hearty thanks.

Firstly, the immobility of the afflicted joint, which is so complete, that scarcely the slightest movement can be effected. If the patient is induced to execute a movement, it will be easily perceived that such is not executed by the hip-joint, but by the whole pelvis in its lumbar articulation.

It is beyond any doubt, that the fixing of the thigh-bone is, to a certain extent, voluntary on the part of the patient, produced for the purpose of escaping the excessive pain caused by the slightest movement. But it is also certain that another agency is called into operation, independent of volition, for we find the same immobility existing during sleep, when the will of the patient is dormant. No other physiological solution of this phenomenon offers itself than the reflex action of the spinal cord, excited by the irritation going on within the affected hip-joint. This reflex action manifests itself in many other instances under the same or similar conditions, and accompanies, more or less, the inflammatory processes of other joints, especially those of the vertebral articulations, producing that peculiar stiffness of the spinal column so characteristic of the disease. But hereby the reflex action is not exhausted, on the contrary, it displays a far greater influence, which I shall now proceed to notice, viz. :

Secondly, the apparently elongated and shortened state of the affected extremity.—The elongation may be observed now and then in the commencement of the disease, while the shortening is characteristic of the later stages. But this is by no means so constant as Rust, Chelius, and others have endeavored to show, nor is the physiological synthesis of those writers any thing beyond speculation and theory; for we do not meet with the elongation so regularly as to justify us in establishing a *stadium elongationis*, nor is the shortening of the leg a constant symptom of the later periods of the hip-joint disease, but, on the contrary, appears far more frequently at its very commencement, and remains not only the constant companion to its exit, but even surpasses it, and afterwards constitutes a most conspicuous and lamentable disfiguration. Rust supposed the elongation to originate in the inflammatory swelling of the joint and its integral parts, whereas the shortening he attributed to a luxation of the caput femoris upon the os ilium. But this opinion will prove itself utterly falla-

cious when it is put to a deliberate test. Theoretically, it is impossible to deduce from the mere swelling of a thin cartilaginous covering, an elongation of the leg amounting to some inches, and any person who has ever seen that deformity of the hip-joint, caused by true luxation, would never confound it with the formal change which takes place in consequence of the shortening of the leg by hip-joint disease. But let us examine without prejudice the actual state of the patient, and inquire into its physiological nature.

In a case of hip-joint disease accompanied by apparent elongation of the limb, if we place the patient on an even and horizontal surface, and then compare the relative position of the different parts, we perceive that the pelvis is in a state of declivity, the healthy side being drawn upwards, and the affected side pushed downwards; the shoulders are likewise displaced from their equilibrium, their axis of motion forming with the horizon an acute angle; and finally the spinal column is simply curved and distorted towards the affected side, in strict accordance with the declivity of its basis. We find, moreover, the dorsal and abdominal muscles on the healthy side in a state of moderate contraction. It requires scarcely any further proof of the assertion, that the elongation before us is but apparent and not real, and caused exclusively by muscular actions; for in taking and comparing the measurement of both legs, commencing at the crista of the os ilium above the hip-joint, and proceeding to the trochanter-major, or to the knee and foot joints, we find but a trifling difference in the actual length of both limbs. Should any doubt remain, we may place the patient under the influence of chloroform, and thereby putting the muscular action entirely at rest, at once restore the proper equilibrium of pelvis, spine, and shoulder axis.

Although the patient, to a slight extent, may produce that position of the pelvis just described by voluntary muscular action, still I believe that for the most part it originates in reflex action, for the position cannot voluntarily be adhered to and remains the same during sleep. The apparent elongation of the effected extremity is, however, but of short duration, and is followed by the direct reverse symptom, namely, the apparent shortening of the leg. This symptom

depends exactly and most unquestionably on the same physiological cause, viz., muscular action under the influence of the reflex function of the spinal cord, whereby only the special muscular groups are changed. The morbid side of the pelvis is drawn upwards, the corresponding shoulder lowered, and the spine forms a simple distortion from its perpendicular, towards the opposite side. This position once assumed by the patient, gradually gets worse, and is placed beyond volition. Even here we may easily detect the real state under such delusive appearances, by measuring the angle which the transversal axis of the pelvis forms to the horizon; by comparing the actual length of both legs, in the way above mentioned, and finally, by freely administering chloroform to the patient, whereby movement and equilibrium may be easily restored for a few minutes, which is however sufficient for the purpose of diagnosing the head of the femur in its proper place. No doubt, when the hip-joint disease has caused any considerable destruction either of the femoral head itself or the posterior superior portions of the acetabulum, a true luxation may ultimately take place, the fragment of the femoral head assuming a new position on a higher plane and more backwards at the os ilium. But those cases are not only exceedingly rare, but also discriminated easily. The distance between the trochanter major and the crista ossis ilium is diminished, the nates is fuller, the movements rather slack, etc.

Thirdly.—There are still some other deformities in pathologic connection with hip-joint disease, which deserve our full attention. As such, we have to recognize the peculiar position of the morbid extremity, being in a state of flexion both in the hip and knee-joints; in adduction and turning inwards; further, the abnormal inclination of the pelvis, amounting to an angle of from sixty-five to eighty degrees; besides a slight twisting of the pelvis on its longitudinal axis, whereby the healthy side projects and the morbid one retracts. Corresponding with the increased inclination of the pelvis, we meet with an inflection of the lumbar vertebrae towards the front (*lordosis lumbalis*).

If it happens that a patient is suffering from hip-joint disease on both joints, which is, however, exceedingly rare, we find a similar deformity of all the parts just enumerated, as we find them in hip-joint disease affecting one side only.

This, again, contradicts the premise of luxation, because one leg appears short and the other elongated, while by true luxation of the head of the femur, and also in pseudo-union of fracture of the *collum femoris* by means of fibrous substance, in fact, in all those cases where the centre of motion is displaced, and higher than in the normal state, the patient lowers the affected side, in order to equalize the length of both extremities, and to use them alike. Moreover, deformities of this description very often happen in consequence of minor affections of the hip-joint, as its surrounding parts. I have just now a patient under my care from Indiana, who has in all probability suffered only of rheumatismus coseæ, although the meanwhile established deformity is very considerable, the diseased leg being four inches shorter than the other. There has been no caries, no material destruction of any kind; the flexion in the hip-joint is quite free, but the extension and abduction are prevented by the contraction of the interested muscles, which lay like cords at the limb.

In case any other evidence is required in proof that the *caput femoris* remains, in the generality of cases of hip-joint disease, at its proper place within the *acetabulum*, I need but refer to the scores of post mortem examinations on record, in which the femoral head was found so, in spite of the affected extremity being shortened to the extent of three or more inches, thus leaving no doubt about the correctness of my statement. We are perfectly aware that, after the hip-joint disease has passed its phases, the ankylosis has been established, and the patient is gradually beginning to use the affected extremity, this limb, under ordinary circumstances, neither recovers its circumference nor its apparent length, but on the contrary, the leg remains feeble, emaciated, and continues more or less its altered position of flexion, adduction, and turned inwardly; the pelvis also remains in its distorted relation. The position of the femur may perhaps become amended by its own weight, which counteracts the reflex action of the spinal cord; but the position of the pelvis remains permanent, giving rise to that singularity of gait and walk, common to all patients who have suffered from hip-joint disease, and which consists in a rolling movement of the trunk, on the diagonal diameter of the pelvis, from the healthy side to the affected.

One fact deserves to be mentioned in reference to the distortion of the spinal column; namely, that scoliosis, which necessarily accompanies the declivity of the pelvis, is only present in the erect position of the patient, while it disappears in the recumbent, independently of the length of time during which the distortion has existed, thus giving a most important evidence against the established opinion, that muscular actions, in themselves, are a sufficient cause for permanent deformities of the spine. This special subject, however, will have due consideration in a subsequent article.

In now drawing the attention of the reader to the *treatment* of hip-joint disease, I shall limit myself to a few points, which may be considered of the greatest importance in the discussion of the subject before us.

Let us therefore ask, *Does the present state of our knowledge afford us the means of shortening the process of hip-joint disease?*

This question is one of great moment, and therefore deserving the gravest consideration of the profession. In entering upon it, we should bear in mind, that hip-joint disease consists in nothing else than tuberculous deposits within the parenchyma of the femoral head and its subsequent elimination; that it is the ultimate effect of the efforts of the *vis natura medicatrix* to free the organism of a heterogeneous substance, highly obnoxious to its health and existence, and that inflammation, suppuration, &c., are but the means employed for that purpose. If this opinion be true, and, I think, the instituted inquiry and experience places it beyond any doubt, the medical practitioner has to adopt a treatment which directly co-operates with the efforts of nature in speedily removing the obnoxious tuberculous matter from within the limits of the organism.

Two medical agencies have been put in requisition to realize this object; they are, external derivation and the resection of the diseased portion of the femur. During the last century derivatory appliances, near the affected joint, have been used to a great extent, from the simple rubefacient up to the positive destruction of the skin by cauterium actuale and potentiale, and a fair trial has been consequently given to them to prove their beneficial results. The numerous advocates of derivation assert boldly, that nature was doing the same

by the operation of metastasis, in depositing obnoxious substances in organs of inferior consequence, thus freeing others of great importance for the maintenance of life, of which, indeed, daily experience furnishes us with many instances. If metastasis were identical with derivation, the conclusion would be correct. But I entirely disagree on this point; for the metastatic deposits of nature are materially of the same quality, whereas artificial derivation merely excites inflammation, and produces a discharge of ordinary character. Thus we may artificially transfer an erythematous inflammation of the pleura upon the skin by a mustard poultice, and put a positive stop to primary disease; in fact, we may succeed in subduing diseases by derivation, in as far as both the disease and the effect of derivation constitute the same character; but it might be an impossibility to influence by derivation the process of hip-joint disease, where the cause of the affection is a specific substance purposely deposited for elimination, while inflammation is the mere effect of the undue pressure upon the osseous texture. And, supposing derivation could even direct the tuberculous matter from the system to the artificial issue, which is by no means evident, it would in no way affect the deposits already formed within the cells of the femoral head. There the inflammatory process will and must go on for the final elimination of the tuberculous deposits. Any positive counteraction can only tend to protract the course of hip-joint disease to an unnecessary length, and place even life in jeopardy. While it is thus exceedingly doubtful, at the least, whether derivation has any influence upon the tuberculous disease in general, and while it is positively impossible that derivation should affect the tuberculous deposits already formed, we know it to be a fact, that extensive issues particularly cause a new irritation, enfeeble the system already emaciated, and may even endanger life.

Thus we must unavoidably come to the conclusion, that derivation, in cases of hip-joint disease, is not only to be dispensed with, but even to be severely condemned. But what are the results that experience gives us in reference to the usefulness of derivation in hip-joint disease. I need only state, that it has been entirely abandoned both in England and Ger-

many, where, formerly, scarcely one patient escaped the application of the *terrum candens*.

I shall be deemed excusable for having devoted so much space to the discussion of this question when I state, that I have met, in this city, with a favorable opinion in reference to derivation in such cases, and even in quarters where the highest talents, with the most ardent scientific exertions, are in full operation.

As to the usefulness of resecting the caput femoris in hip-joint disease, to answer the indication of speedily removing the morbid substance destined for elimination, I must candidly confess that I have had but little opportunity of witnessing and watching personally the effects of that operation. In as far as statistics afford the premises for correct inferences, I must decidedly object to it, and John Gay, Esq., the highly talented surgeon of the Royal Free Hospital in London, has, in his elaborate paper on the treatment of the ulcerative diseases of the joints, read before the Medical Society of London, stated, with convincing arguments, that very little good is to be expected from so extensive an operation. According to the statistics of this operation, which that surgeon placed under the consideration of that learned and respectable body, the greater number of the patients subjected to the operation in question died from the immediately succeeding inflammatory reaction, while another fraction died from tuberculosis, and a very insignificant proportion only survived. This is a decidedly discouraging statement, and its correctness and truthfulness cannot be questioned.

In the place of resection, Mr. Gay proposed free incisions into the diseased joint, and even into those parts of the bones filled with tuberculous deposits. This practice he had already followed during a certain period with the best success, although only in the minor joints. A very lively discussion ensued, in which many eminent members of the profession participated. Experience, reasoning, and sophism were brought to bear against the new practice, but with the least possible success. The author in replying at the end of the debate to his antagonists, remarked that a diseased joint was nothing else than an ulcer in the bone, or cartilaginous texture; the joint was partly de-

stroyed, and had thus ceased to exist. The violent reaction which regularly follows the opening of a joint, referred only to healthy articulations, but in no way to articular ulceration. The free access of air to the articular cavity was less injurious than the decomposed matter, tuberculous substance, or the fragments of mortified cartilage.

To procure in all deep-seated abscesses and ulcerations a speedy and free issue, was a fundamental principle in surgery, and especially in those cases strictly to be adapted, where fragments of mortified cartilage, identical with foreign bodies, constantly keep up irritation and suppuration, thus protracting the termination of the disease. All *a priori* arguments could not dispute the beneficial results, already attained by his practice.

These new principles of Mr. Gay opened at once a new era for the treatment of the joint diseases, and although old surgeons shook their heads at the boldness of modern surgery, the younger part of the profession embraced the new chance for success with eagerness.

In some of the metropolitan hospitals, as well as in county infirmaries, the new measures were frequently put to the test, and as far as I could learn, the results have been favorable. My own experience of Mr. Gay's treatment, both in London and Manchester, obliges me to declare in its favor; it is in my opinion the only direct remedy for the abbreviation of hip-joint disease, and it is not, to my knowledge, followed by any dangerous reaction or fatal consequences. I understand, that Dr. John O. Stone, the distinguished surgeon of Bellevue Hospital, New-York, advocates the same practice, and has since 1847 derived great benefit from it.

The next important question is: *Do the modern improvements in surgery furnish us with the auxiliary means of preventing or curing those deformities, which are the constant associates of hip-joint disease?*

But a few years ago, the surgical literature of France, Great Britain and Germany, was devoid of any guidance as to the orthopedic treatment of deformities in cases of hip-joint disease, nor even were directions given as to the most comfortable and proper position in which to place the patient. The want of proper regard as to the collateral deformities, did not rest with the hip-joint only, but extended even to the

minor joints where the necessary provision could be taken far easier. As it was thus left to the patient, to place and keep the affected parts in a position convenient to his comfort and rest, and no attention was paid to the future form, position, or usefulness of the limb, it does not at all surprise us that most of the patients left their sick beds deformed, and more or less mutilated. This malpractice had existed sufficiently long, when, at length, the attention of the profession was directed to it. But the remedies and contrivances being put into operation, were more especially directed against the effects of articular diseases. The necessity of preventing the deformities by the seasonable application of mechanical means still escaped the notice of surgeons.

Strehmeyer has just claims on the gratitude of both surgeon and patient, for the reintroduction of tenotomy and myotomy into surgery, and Dieffenbach has essentially contributed to the rational performance of those operations for the cure of articular deformities. Some time had still to elapse, before surgeons were induced to take some steps towards preventing them, which is, however, now acknowledged as a surgical rule. While thus surgical practice in general advanced to greater perfection, and the articular deformities (if I may be permitted to use that expression) were attacked from all sides, the collateral deformities of hip-joint disease still remained untouched, like a "*noli me tangere*," nor shall we be surprised at this state of things if we take into consideration the established supposition, that the *caput femoris* is luxated, and the power of prejudice in favor of a long established opinion. At about the same time Dr. Buchring of Berlin, the highly gifted nephew of the immortal Dieffenbach, Dr. Lorinser of Vienna, and Dr. Bonnet of Lyons, entered into minute researches on the subject in question, and obtained universally the same result, namely, that the former theory of hip-joint disease was fictitious and arbitrary; that the deformities connected with that disease had a dynamical, and by no means an organical foundation, and thus bringing at once, the most distressing mutilation within the reach of surgical aid. Some difficulties, as to the mechanical contrivances, were soon surmounted, and the new discovery put to a practical test. I am happy to state that already

results have been obtained, which leave no doubt as to the efficiency of the new systematic treatment, and I myself can confirm them by my own experience.

The key of the problem having been found, it is not at all difficult to comprehend its nature, as in all diseases of the joints, we have to contend with a train of symptoms entirely depending upon that mysterious function of the spinal cord which we comprehend under the head of reflex action, and which, in spite of numerous experiments, vivisections, and scientific efforts, is still a "*deus ex machinâ*." That epilepsy, catalepsy, eclampsy, St. Vitus's dance, tetanus, trismus, spasms, and scores of other pathological phenomena, are the visible effects of reflex action, is no longer doubtful; besides, we know a vast number of circumstances under which reflex action occurs, and stimuli that produce them; but still our knowledge, as to the histology and the function of the spinal cord, and its ganglionic appendices, is far from perfect and infallible. We may, however, try to point out some analogies in physiology and pathology, the comparison of which may lead to some conclusions important both to science and practice.

Comparative physiology informs us of the facts, that not only all the organic functions are carried on by the agency of the vesicular nervous substance, the anatomical representative of reflex action, and that the brain has nothing to do with them; but that even the contractions of voluntary muscles, and consequently locomotion, are, to a great extent, dependent on the reflex action of the spinal cord. In a frog, if the spinal cord is divided transversely, and thus the connection with the brain destroyed, we may still excite muscular action by directly or indirectly stimulating the divided portion of the spinal cord. The entire removal of the brain would not alter this fact. In centipedes, the coiled movements of the isolated part of the body will always go on in spite of the resistance of that part of the body which is still in its integrity with the cephalic ganglia. Neuro-pathology furnishes us equally with phenomena corroborating the results of physiology. If an injury has been severe enough to produce the effect of a complete division of the spinal cord, namely, paralysis, the control of the will is lost over the paralyzed parts, and no

sensuous impressions on them are conducted to the brain. As long as the lower segment of the cord remains sound, and the nervous connection with the limbs unimpaired, distinct reflex action may be excited in the limbs by appropriate stimuli.

I met with a case about ten years since, which I deem particularly appropriate to illustrate the foregoing statement. A young man, of about 25 years of age, caught a severe cold while in a state of great heat and perspiration. A few days afterwards he partially lost the control of his lower extremities; in about three months' time his legs were paralyzed, in as far as *voluntary* movement and sensation were concerned; but the limbs were, nevertheless, in a state of tonic spasm, or, so to speak, of tetanus, which extended itself over all the flexors and extensors, adductors and abductors, keeping the extremities as rigid as a rod of iron; the muscles were hard and firm, and for years did not lose their bulk or tone. As soon as the glans penis of the patient, or the large toes, were touched or even pinched, most violent convulsions ensued, which, however, did not last more than a few minutes, and generally subsided with the stimulation.

Thus we have a case where, in all probability, simple exudation and subsequent pressure upon the spinal cord not only isolated the lower portion of that organ from the control of the will and sensation, but became itself a permanent stimulus to the gray substance of the cord, followed by tetanic contractions. Notwithstanding this permanent excitation of the spinal cord, that very reflex action ensued in the shape of convulsion from indirect and minor stimuli. This is only one instance of a very large number of cases on record; in fact, we meet every day with the like, and which become only comprehensible by the full understanding of the reflex functions.

Limited as our knowledge on the subject may be, we are nevertheless fully justified in applying those few facts already established to practical purposes. Reflex action, originating in morbid causes, may be of ephemeral, periodical, or continuous duration, but the prognosis depends by far more on the casual intensity and accessibility, than on its typical appearances. Fortunately, the prognosis of those muscular reflex actions, to which joint diseases commonly give rise, is by no means a

bad one; on the contrary, most, if not all of them, lie within the compass of surgical cure, by means of permanent extension. If we are attacked with muscular cramps in the legs, we force the affected limb into the reverse position, and thus get rid of so painful a muscular contraction. We perceive that those deformities which remain from hip-joint disease, in as far as the afflicted leg is concerned, gradually amend, and the leg, in time, assumes a straight form by the mere weight of that extremity, which acts like an extension. I refer further to numerous cures of contractions of various joints, obtained by the sole agency of permanent extension; and the results of this very treatment in hip-joint disease, already established, leave no doubt as to its efficacy in these and similar cases.

Thus, it appears that we possess in permanent extension a sovereign remedy for overpowering muscular reflex action, and ultimately restoring the greatly distorted form.

The modus operandi of mechanic extension is of course still a mere problem; we know at present only the fact. The question, in reference to the general curability of those deformities, originating from hip-joint disease, may safely be answered in the affirmative.

But it remains yet to be decided, whether permanent extension may effectually be applied to the purpose of preventing those deformities; or, whether it be advisable not to interfere while the disease of the hip-joint is progressing, and to have recourse to it only when that malady has terminated its phases.

Some surgeons will have the orthopaedic treatment postponed until the morbid process within the joint is completely terminated; others are in favor of acting immediately. The decision cannot be difficult. It is far better to prevent a deformity than to cure it, especially if there are no contraindications of immediate extension. The excessive pain has been mentioned as such, and no doubt will set in with injudicious orthopaedic treatment. But we have it in our power to avoid it. If in the very beginning of hip-joint disease we place the hip in a firm position, which secures both the rest and extension of the afflicted leg, and the comfort of the patient, as we ought to do, there is no reason why the patient should not be capable of enduring it, provided the mechani-

ed contrivances answer the purpose. On the contrary, the patient will be grateful, as such position saves him the pain, unavoidably caused by accidental movement. In fact, the early use of mechanical treatment has every thing in its favor.

1. It meets the first rule of surgery, by giving the affected limb a quiet position.

2. It counteracts the reflex action, and prevents consequently the deformity.

3. It keeps the caput femoris in the anterior and lower part of the acetabulum, thus preventing any luxation to which circumstances and the extent of caries might tend.

4. It does not cause, but relieves the pain.

But if the patient is already in an advanced stage of the disease, it will be necessary to place him under the full influence of chloroform before the apparatus is applied. In this state reflex action and sensation are arrested. We may with impunity and at once stretch the patient, and give him that position in the instrument which we deem proper. When the effects of the chloroform have passed by, and the patient is returned to consciousness, he will only not complain, but on the contrary will feel greatly relieved, and more comfortable than before. At least I have obtained these results in all cases under my personal care, and there is no reasonable ground why it should be otherwise. To keep the patient in the position once assumed, will suffice to prevent or cure the deformity. Should there however remain a slight deviation, I prefer the repeated use of chloroform and the total restoration of the form under its influence, to the gradual increase of the extension, which is extremely painful.

If, however, the disease of the hip-joint is completely removed, and we have only to contend with a painless muscular retraction, a reflex action of some duration, I prefer the gradual extension to the former, for a sudden extension has not in this case the desired effect, and might bring on a new irritation in the joint, which Dr. Buehring experienced. In point of fact, gradual extension is better calculated to neutralize a long established and powerful reflex action, than the sudden reduction of the deformity.

I need hardly mention, that the proper construction and application of the mechanical contrivances are of great moment, and in truth govern the ultimate result of the treatment. Besides, the greatest care and circumspection on the part of the medical attendant, as well as great patience on the part of the patient, are highly desirable requisites for the consummation of the cure. That the results of the above treatment will be far safer in a hospital, or in the house of a surgeon, is evident.

In the preceding pages I have attempted to delineate the pathological state, and the rational treatment of hip-joint disease (coxarthrocace), and if the deficiency of my knowledge of the English language has not disqualified me, I flatter myself that I have contributed to the better understanding of the proximate cause of that malady; to the more physiological appreciation of its symptoms; to a more correct diagnosis, and more successful and speedier cure. The errors of former times, in regard to hip-joint disease, have been principally occasioned by the want of diagnostic discrimination, and by confounding different complaints under the same head with that affection.

But the limited state of our knowledge on pathological anatomy may be deemed an admissible plea for errors thus committed. Hence we understand why remedies of contrasted properties and actions have been asserted to be most useful agents in cases of supposed hip-joint disease, and methods of various descriptions have been recommended for one and the same object. With the advancement of knowledge all those vague suggestions must necessarily fall to the ground, and give way to rational proceedings; for it is evident, and requiring no further commentary, that an innocent rubefacient, dry or wet cupping, &c., cannot alleviate the process of tuberculosis, the softening and elimination of tuberculous deposits, although they may be valuable remedies in simple coxalgia, or rheumatismus coxae.

Some medical practitioners entertain a great dislike of mechanical appliances. True enough, mechanical treatment has been very often misapplied, and may have thereby produced greater evils than those against which it was directed; but the misuse cannot prohibit the proper use of mechanical

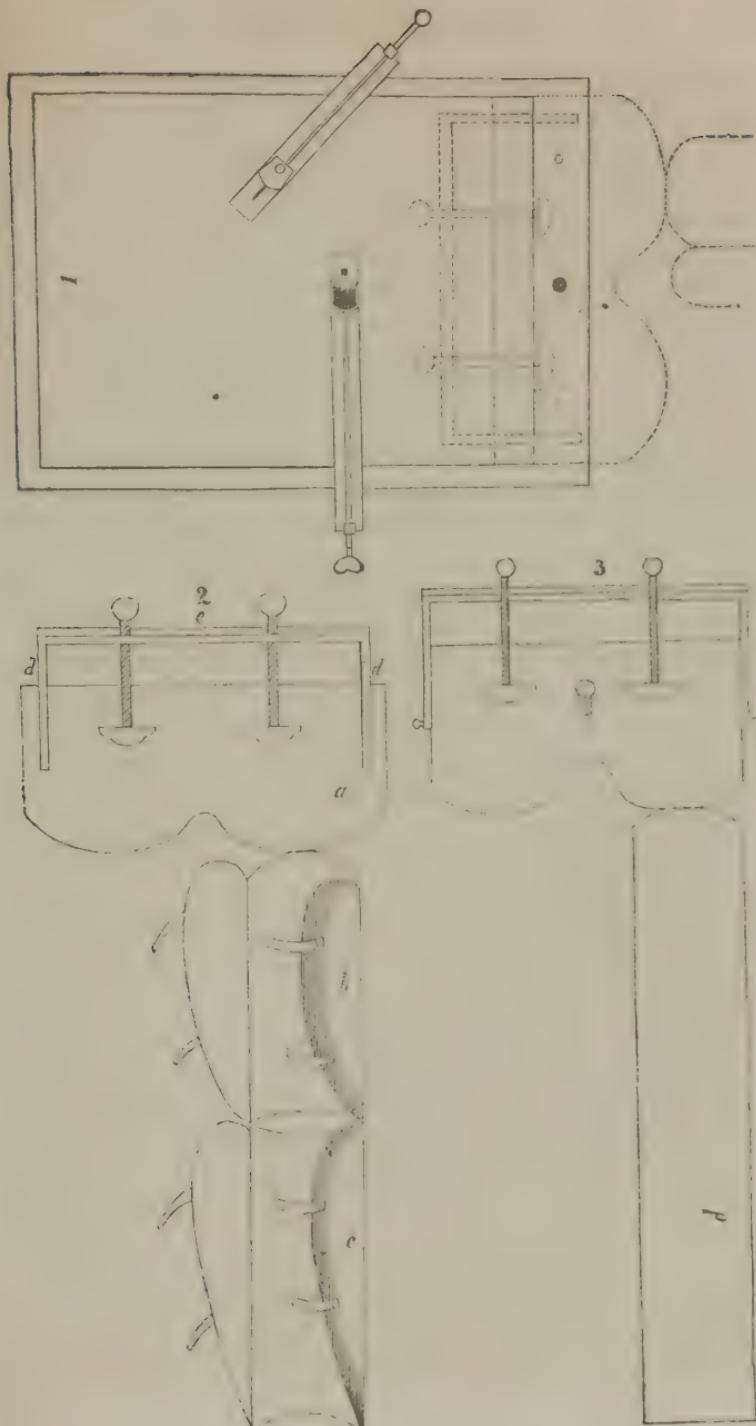
remedies, from which we may derive great advantage and benefit where all other means have failed in proving successful. Where the mechanical laws and arrangements of the body are disturbed, we can only by mechanical means restore and rearrange them. This is according to rule. It would be just as absurd to treat epilepsy and typhus with mechanical remedies, as wry-neck, club-foot, spinal deformities, the opening of a rupture, &c., with pills and mixtures. In fact, mechanical treatment is becoming gradually more appreciated by the profession. I will merely refer to the modern introduction of compression in cases of aneurism, articular tumors, the ligation of various veins, &c., as having produced most marvellous results. Drs. Buehring, Lorinser, and Bonnet have exerted their ingenuity to construct various apparatus for the ultimate cure of the deformities accompanying and following hip-joint disease. Each of their contrivances has certain merits, although none of them consummate the object intended. Dr. Buehring's apparatus is but of little real value, keeping the patient in a most inconvenient position, which can hardly be endured for any considerable length of time. Dr. Lorinser's is a somewhat modified double inclined plane of Liston; but neither contrivance influences the distorted position of the pelvis.

In order to accomplish the following indications—

1. Stretching of the knee and hip-joint,
2. Abduction of the affected limb,
3. Restoring the parallelism of the transversal diameter of the pelvis with the horizon; and

4. Securing comfort and convenience to the patient—

I have constructed the apparatus illustrated by the diagrams annexed. It consists in an upper and lower half, with an iron frame; the lower half is made of two pieces of board, *a b*, fig. 1, and joined together by a hinge, which allows *c* to move to the side. The upper half is likewise made of wood, and consists of three pieces: *a*, fig. 2, is but little larger than *d*, fig. 1; it can be raised by a double screw, *f*, from the latter, and is prevented from turning laterally by two iron poles, *ad*, figs. 1 and 2, being fixed at the lower board and perforating the upper one. Two small iron pieces are joined with

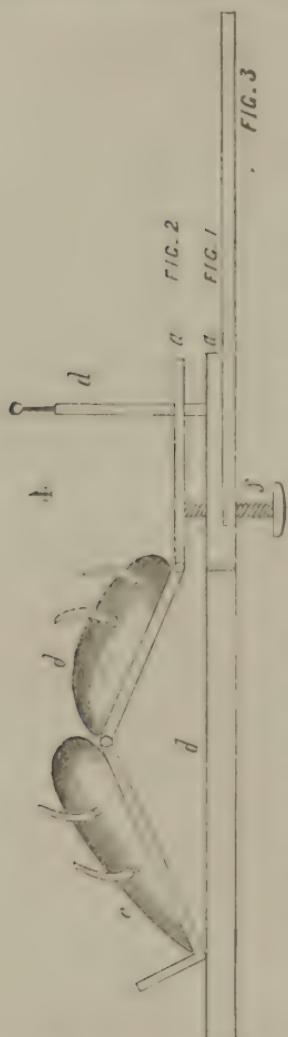


them, thus forming *c*, fig. 2, a sort of scaffold, on which two screws, with well covered pads at their lower end, are fastened. *c*, fig. 2, is the board for the thigh of the afflicted extremity, being immovably connected with *a*, fig. 2, by means of a ball-and-socket joint, and also, by a simple hinge, with *e*, fig. 2, the movements of which are, however, governed with an Archimedean screw.

The third part is, *c*, fig. 2, for the reception of the lower portion of the limb, including the foot: for the latter a separate board is affixed to it in a right angle. The upper extremity of *c*, fig. 2, joins with *b*, fig. 2, as described, and the lower has two rolls affixed to it to render it movable on the surface of *b*, fig. 1. On each side of *b* and *c*, fig. 2, are splints attached, and proper contrivances for the reception of straps and buckles. The iron frame, fig. 3, is an oblong square. At its lower part the board *a*, fig. 1, is immovably fastened; on each side is a pad, so arranged as to be turned as well as to be screwed forwardly.

The whole apparatus, being represented in profile, in fig. 4, is commodious, and portable. For special use, it must be made of proper dimensions, according to the case. It is to be placed upon a firm mattress, well covered with bolsters, raised in such angles as the position of the distorted parts require. The patient is now laid on it, the extremity fixed on the inclined plane by means of the splints, straps, and buckles; the screws,

c, fig. 2, are directed towards the anterior superior spinis of the ossa innominata; ultimately, one of the pads of the

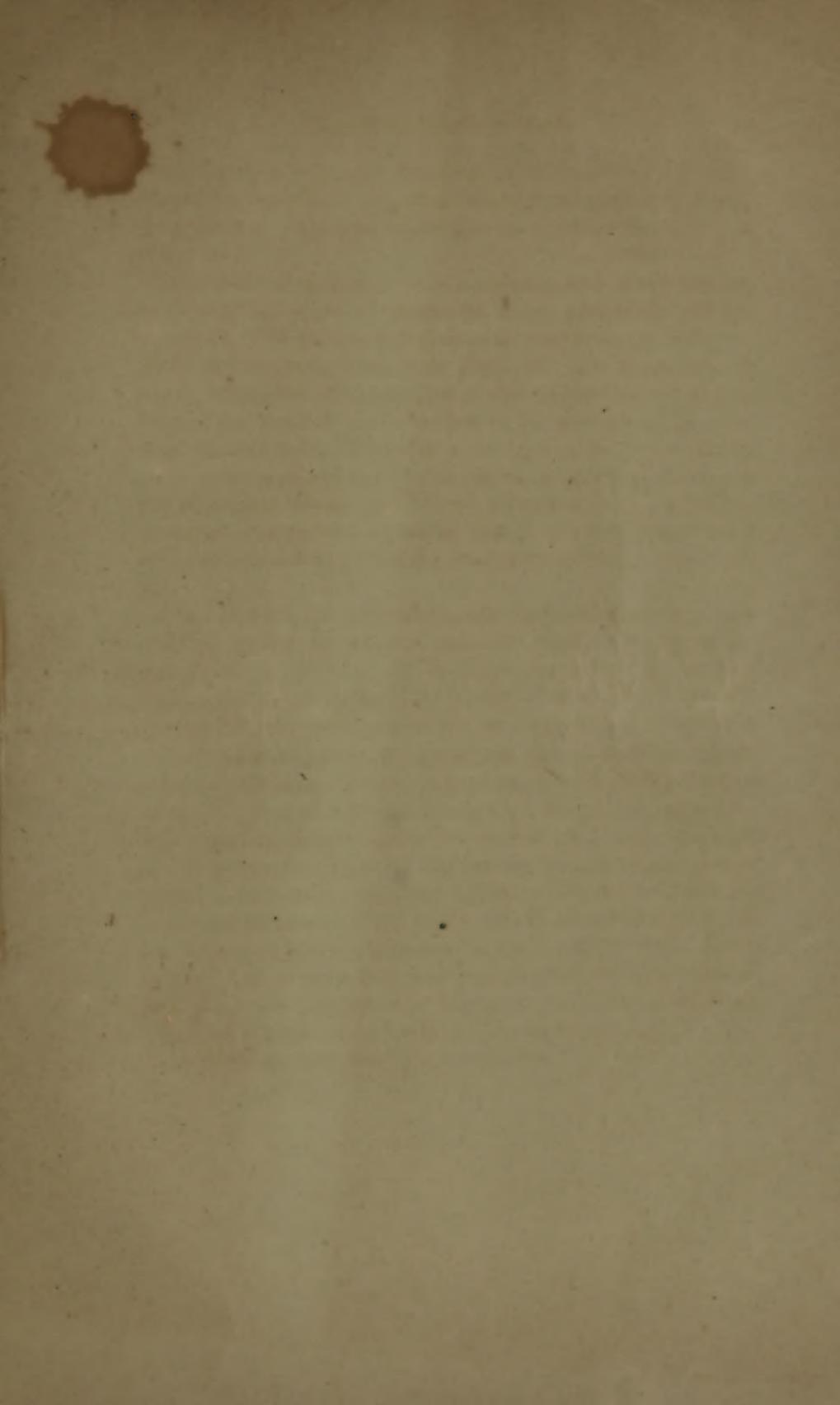


frame is placed in the lowered axillary cavity, the other against the most convex part of the deformed spine, and thus the patient is placed as firmly and as comfortably as is possible.

The further management of the apparatus depends now entirely on the mode of extension being preferred. If the quicker way is chosen, the patient is put under the influence of chloroform, and, when quite insensible, and the muscles in a state of perfect relaxation, all the screws are turned so as to amend the position and the form of the patient, which is indeed an easy task. Whether it is preferable to do this at once, or by repeated use of chloroform, depends, of course, on the existing circumstances of each particular case. After this operation, the patient is merely kept in the new position, the apparatus thus being only the instrumentality of retaining his form.

If, however, the hip-joint disease has terminated its phases, and the patient be without pain, the gradual extension appears to be preferable. If the description of my apparatus is duly comprehended, the management of it cannot be difficult; but, as the cases of hip-joint disease may vary in reference to deviations of the form, the apparatus should undergo the desired modification. Besides, all attention and care on the part of the surgeon should be devoted to the patient, to relieve him from unnecessary severity, pressure, and other avoidable inconveniences. Thus he will become gradually accustomed to the recumbent position, and will have hope and confidence as to the ultimate result of the treatment. It cannot be denied that the treatment is rather of a tedious kind, both for surgeon and patient; but perseverance and patience will be amply compensated by the restoration of form and usefulness of the limb, which would otherwise be doomed to be crippled.

543 *Atlantic street, Brooklyn, August, 1853.*





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